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**Chairman**  
**Committee on Science**  
**Subcommittee on Energy**  
***Technology Decisions in the Nuclear Fuel Cycle:***  
***Reprocessing, Recycling and Waste Management***  
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I want to welcome everyone to this hearing on the nuclear fuel cycle, and the potential for reprocessing and recycling to help us better manage the nation's growing inventory of spent nuclear fuel.

To start, I want to quickly review our current situation to put today's hearing into some context. Twenty years from now, electricity demand in the United States is expected to increase by 50 percent. If we are to meet this incredible growth in demand without significantly increasing emissions of greenhouse gases, we must maintain a diverse supply of electricity, and nuclear power *must* be part of that mix. Nuclear energy is the only carbon-free source of electricity that is currently operating on a commercial scale nation-wide. We know how to use nuclear energy, and we know how to use it safely. But if we are to continue to benefit from safe, emissions-free nuclear power for at least 20 percent of our electricity, there is one more issue that must be resolved – what we do with growing inventories of spent nuclear fuel.

Yucca Mountain was to be **the** solution. However, its intended opening slipped from 1998 to 2010, and is now likely to slip again to 2012 or 2014 according to the Department of Energy (DOE). This failure to open Yucca Mountain as scheduled – or deal with the spent fuel accumulating at our nuclear power plants in other ways – may soon cost the federal government up to \$1 billion annually in legal liability and interim storage costs. And when it does finally open, Yucca Mountain will be full. It is limited by statute to store only as much spent fuel as will have been created by 2010.

That Yucca Mountain, for all intents and purposes, already is full should come as no surprise. If you think of nuclear fuel like a log, we currently burn only three percent of that log at both ends, and then pull it out of the fire to bury it in a mountain. The bulk of what we call nuclear “waste” is actually nuclear “fuel” that still contains over 90 percent of its original energy content. Does that make any sense? No, but that's our current policy, and it's just plain wasteful. Unless we do something different or take another approach, a second repository, or an expanded Yucca Mountain, will be required. Politically, fiscally, and logistically, this will be no easy task, and could preclude greater use of emissions-free nuclear power.

For years now, scientists at DOE and a number of its national laboratories have been working on “new approaches” to dealing with commercial spent nuclear fuel and solving the long-term Yucca Mountain problem. More specifically, they have developed technologies and processes to do something with spent nuclear fuel besides bury it all in a mountain, like reprocess and then recycle parts of it into new fuel for reactors.

There are many advantages to these technologies, which have names like UREX+ and pyroprocessing. Let me just name a few.

First. They are proliferation resistant unlike the 30 to 40 year-old technologies already in use.

Second. They reduce the volume of our nuclear waste, which could render another Yucca Mountain unnecessary.

Third. They also could reduce the toxicity – the heat and the radioactivity – of the waste.

To fully realize these benefits and deal with the growing inventory of spent fuel, the Fiscal Year 2006 Energy and Water Appropriations bill, passed by the House last month, requires the DOE to develop an integrated spent fuel recycling plan by the start of fiscal year 2007, and select a reprocessing technology by the end of fiscal year 2007. I am pleased that my colleague and the author of that bill, Chairman Hobson, has joined us here today.

These activities could be the key to better managing our spent fuel. Reprocessing is just one step in the entire fuel cycle – the cradle-to-grave path of nuclear fuel. However, it is the first step to better managing our waste. We can learn lessons from what the French and the Japanese have done with reprocessing. I know I did after visiting French reprocessing facilities with Chairman Hobson in early April. We can continue to improve upon their technologies, processes, and monitoring capabilities.

But we almost certainly won't achieve these improvements without first doing a comprehensive systems analysis. Technology decisions for reprocessing must take into account technology and policy decisions for the *entire* fuel cycle. For example, we need to know if the reprocessing technologies under discussion here today are compatible with designs for the next generation nuclear plant (NGNP). Through modeling that incorporates the relevant technical, economic, and policy considerations, this "systems approach" will allow us to optimize the fuel cycle and make an informed decision about reprocessing.

Finally, how much could all this cost? That's a good and important question, which is why it will be the subject of another hearing at a later date.

This is a complex topic, and one that involves many interrelated technical and policy issues. Yet the technologies and policies we will discuss today could help determine whether nuclear energy becomes an even more significant source of emissions-free electricity when we need it most in the years to come. And so to conclude, I want to thank the witnesses for agreeing to share their knowledge and insight with us today, and I look forward to an open and spirited debate on this very important subject.